

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
SAN FRANCISCO BAY REGION

ORDER NO. R2-2003-0088  
NPDES PERMIT NO. CA 0037702

AMENDING WASTE DISCHARGE REQUIREMENTS FOR:

EAST BAY MUNICIPAL UTILITY DISTRICT  
SPECIAL DISTRICT NO. 1  
WATER POLLUTION CONTROL PLANT  
OAKLAND, ALAMEDA COUNTY

The California Regional Water Quality Control Board, San Francisco Bay Region, hereinafter called the Board, finds that:

**Purpose of Amendment**

1. The purpose of this Order is to implement the requirements of State Water Resources Control Board (State Board) Order No. WQO 2002-0012, which remanded certain portions of Order No. 01-072 for clarification and reconsideration. Specifically, this amendment implements the last sentence of the full paragraph on page 16 of Order No. WQO 2002-0012 and Conclusion Nos. 13, 16, 19, 21 and 24 of Order No. WQO 2002-0012. Also, this Order amends the limits for bis(2-ethylhexyl)phthalate, 4,4-DDE, and dieldrin in response to new information not available at the time Order No. 01-072 was adopted.
2. This Order
  - a. amends and adds Findings to Order No. 01-072 as described below;
  - b. removes the effluent limit for bis(2-ethylhexyl) phthalate; and
  - c. replaces the final limits for 4,4-DDE and dieldrin with interim monthly average limits.

**Background**

3. On June 20, 2001, the Board adopted Order No. 01-072, Waste Discharge Requirements, reissuing National Pollutant Discharge Elimination System Permit (NPDES) No. CA0037702 for the East Bay Municipal Utility District, Special District No. 1, hereinafter called EBMUD or the Discharger, to discharge treated wastewater to Central San Francisco Bay, a water of the State and the United States.
4. The Discharger and Bay Area Clean Water Agencies filed petitions with the State Board for review of Order No. 01-072 in July 2001.
5. On July 18, 2002, the State Board adopted Order No. WQO 2002-0012, which mostly upheld the Board's action. However, the State Board remanded certain portions of Order No. 01-072 to the Board for reconsideration.

**Discharge Description**

6. The Discharger owns and operates the East Bay Municipal Utility District, Special District No. 1 Water Pollution Control Plant, located at 2020 Wake Avenue in Oakland. The plant provides secondary treatment of wastewater from domestic, commercial and industrial sources from the cities of Albany, Alameda, Berkeley, Emeryville, Oakland and Piedmont, and from the Stege Sanitary District.

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7. The Discharger discharges treated wastewater through a submerged diffuser adjacent to the San Francisco-Oakland Bay Bridge about 5,664 feet off shore at a depth of 45 feet below mean lower low water (Longitude 122 deg., 20 min., 55 sec.; Latitude 37 deg., 49 min., 2 sec.).

#### **Reasonable Potential Analysis for bis(2-ethylhexyl)phthalate**

8. The State Board Order No. WQO 2002-0012 (Conclusion Nos. 14 and 26) indicates that, given the lack of a planned TMDL for bis(2-ethylhexyl)phthalate, Order No. 01-072 should be revised on remand to include a final limit to ensure compliance with the numeric CTR objective unless the Board determines, based on a review of new evidence on remand, that EBMUD's discharge does not have a reasonable potential to cause or contribute to a violation of the water quality objective, in which case, a final Water Quality Based Effluent Limit (WQBEL) for bis(2-ethylhexyl)phthalate is not required.
9. Order No. 01-072 specifies an interim limit of 102 µg/L for bis(2-ethylhexyl)phthalate. The original reasonable potential analysis was based on evaluation of Discharger's self-monitoring data obtained from 1997 to 2000. Bis(2-ethylhexyl)phthalate is a plasticizer in many plastics. Further analysis of those data provided by the Discharger indicates that the original data are invalid due to contamination by sampling equipment (e.g., plastic sampling pipes) or during sample handling and analysis.
10. The Discharger conducted a bis(2-ethylhexyl)phthalate Special Study on their effluent from October 22, 2002 to January 9, 2003. All results that met the data quality objectives were less than the water quality objective for bis(2-ethylhexyl)phthalate of 5.9 µg/L. According to this Special Study, there is no reasonable potential for bis(2-ethylhexyl)phthalate in the Discharger's effluent.

#### **Limits for 4,4-DDE and Dieldrin**

11. The Board has reconsidered evidence previously provided by the Discharger on whether it was feasible to comply with the final limits for 4,4-DDE and dieldrin. All 4,4-DDE and dieldrin effluent values are non-detect and the detection limits are above water quality objectives. Therefore, it is infeasible for the Discharger to achieve immediate compliance. This Order amends Order No. 01-072 by replacing the final limits with interim monthly average limits set at the lowest level that the Discharger can demonstrate compliance.

#### **CEQA and Public Notice**

12. The amendment of an NPDES permit is exempt from the provisions of Chapter 3 (commencing with Section 21100) of Division 13 of the Public Resources Code [California Environmental Quality Act (CEQA)] pursuant to Section 13389 of the California Water Code.
13. The Discharger and interested agencies and persons have been notified of the Board's intent to amend Order No. 01-072 and have been provided an opportunity to submit their written views and recommendations. The Board's Fact Sheet and Response to Comments are hereby incorporated by reference.
14. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

**IT IS HEREBY ORDERED**, that Order No. 01-072 is amended as described in the following items. To distinguish the original language contained in Order No. 01-072 from that contained in this Order, amendments are highlighted by underlining additions and ~~striking through~~ deletions, except for those specified as "Add," "Remove," or "Replace." All numbered elements in Order No. 01-072 shall be

considered as having been renumbered to accommodate additions and deletions in this permit amendment.

#### A. Amendments To Findings

1. In accordance with Order No. WQO 2002-0012, Conclusion No. 16, add the following finding as Finding 27.

**"27. Water Quality Based Effluent Limitation:** The WQBELs regulating toxic substances are derived from water quality criteria listed in the Basin Plan, the National Toxic Rule, the California Toxic Rule, the U.S. EPA Gold Book, and/or Best Professional Judgment (BPJ). This Order's WQBELs are revised and updated from the previous permit's limits and their presence in this Order is based on the Reasonable Potential Analysis evaluation of the Discharger's data, as described in the Reasonable Potential Analysis section,

Maximum Daily Effluent Limits (MDEL) are used in this permit to protect against acute water quality effects. It is impracticable to use weekly average limitations to guard against acute effects. Although weekly averages are effective for monitoring the performance of biological wastewater treatment plants, the MDELs are necessary for preventing fish kills or mortality to aquatic organisms.

- a. NPDES regulations, the SIP, and U.S. EPA's Technical Support Document (TSD) provide the basis to establish MDELs:

NPDES regulations at 40 Code of Federal Regulations section 122.45(d) state:

"For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall *unless impracticable* be stated as (Emphasis added.):

- (1) Maximum daily and average monthly discharge limitations for all discharges other than publicly owned treatment works; and
  - (2) Average weekly and average monthly discharge limitations for POTWs."
- b. The SIP (page 8, Section 1.4) requires WQBELs be expressed as maximum daily effluent limitations (MDELs) and average monthly effluent limitations (AMELs).
  - c. The TSD (page 96) states a daily maximum limitation is appropriate for two reasons:
    - (1) The basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards.
    - (2) The 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed. A maximum daily limit would be toxicologically protective of potential acute toxicity impacts."

2. Renumber Finding Nos. 27 through 66 of Order No. 01-072 to be Findings 28, 29... to 67.

3. In accordance with the last sentence of the full paragraph on page 16 and conclusion No. 13 of Order No. WQO 2002-0012, amend Finding 31 as follows:

***“Dilution and Assimilative Capacity***

~~31~~ 32. In response to the State Board’s recommendation (SB Order No. WQO 2001-06), staff has evaluated the assimilative capacity of the receiving water for 303(d) listed pollutants and pollutants for which ~~EBMUD~~ the Discharger has reasonable potential. The evaluation included review of RMP data (local and Central Bay stations), effluent data, and WQOs/WQC. From this evaluation, staff has found that the assimilative capacity is highly variable due to the complex hydrology of the receiving water. Therefore, there is uncertainty associated with the representativeness of the appropriate ambient background data to conclusively quantify the assimilative capacity of the receiving water. Pursuant to Section 1.4.2.1 of the SIP, “dilution credit may be limited or denied on pollutant-by-pollutant basis...” ~~So-f~~

For bioaccumulative pollutants, based on best professional judgment, dilution credit is not included in calculating the final WQBEL. However, in calculating the WQBEL for non-bioaccumulative, it is assumed there is assimilative capacity, and a 10:1 dilution is granted. This determination is based on available data on concentrations of these pollutants in aquatic organisms, sediment, and the water column. The 2002 303(d) list of pollutants impairing Central San Francisco Bay includes chlordane, DDT, diazinon, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, PCBs, dioxin-like PCBs, and selenium. The following factors suggest that there is no more assimilative capacity in the Bay for these pollutants.

- a. San Francisco Bay fish tissue data shows that these pollutants, except for selenium and PAHs, exceed screening levels. The fish tissue data are contained in "Contaminant Concentrations in Fish from San Francisco Bay 1997" May 1997. Denial of dilution credits for these pollutants is further justified by fish advisories to the San Francisco Bay. The Office of Environmental Health and Hazard Assessment (OEHHA) performed a preliminary review of the data from the 1994 San Francisco Bay pilot study, "Contaminated Levels in Fish Tissue from San Francisco Bay." The results of the study showed elevated levels of chemical contaminants in the fish tissues. Based on these results, OEHHA issued an interim consumption advisory covering certain fish species from the Bay in December 1994. This interim consumption advice was issued and is still in effect due to health concerns based on exposure to sport fish from the Bay contaminated with mercury, PCBs, dioxins, and pesticides (e.g., DDT).
- b. For selenium, the denial of dilution credits is based on Bay waterfowl tissue data presented in the California Department of Fish and Game’s Selenium Verification Study (1986-1990). These data show elevated levels of selenium in the livers of waterfowl that feed on bottom dwelling organisms such as clams. Additionally, in 1987 the Office of Environmental Health Hazard Assessment issued an advisory for the consumption of two species of diving ducks in the North Bay found to have high tissue levels of selenium. This advisory is still in effect.
- c. For PAHs, the denial of dilution credits is based on recent evidence that suggests high molecular PAHs are bioaccumulative with impairing status under further review. The Board staff report entitled *Proposed Revisions to Section 303(d) List*

and Priorities for Development of Total Maximum Daily Loads, dated December 19, 2001, states:

"PAHs are known carcinogens that accumulate in shellfish tissue, but do not accumulate in fish tissue. The weight of evidence from the Regional Monitoring Program (RMP) indicates that although water quality criteria are almost never exceeded at RMP stations (between 0 and 1% of RMP water samples individual PAHs exceeded the EPA and CRT criterion), there is evidence that PAHs may be accumulating at higher levels over time (Hoenicke, Hardin, et al., in prep.; Thompson et al., 1999)."

The Board staff Report Proposed Revisions to Section 303(d) List and Priorities for Development of Total Maximum Daily Loads also states:

"PAH water quality objectives from the California Toxics Rule (CTR) are human health-based and are therefore incomplete with respect to potential impacts to aquatic life described above. PAHs are elevated in sediments of about half the toxic hotspot sites identified in the Bay Protection Program exhibiting a correlative (not causative) but potentially synergistic effect on aquatic life along with other chemicals, as evidenced by sediment toxicity tests and degraded benthic communities (BPTCP, 1998). Occasional exceedances of the human health criteria in ambient samples, evidence of increasing shellfish concentrations, and preponderance of PAHs at toxic sites warrant increased assessment activities for PAHs by dischargers and cities around the region."

For non-bioaccumulative constituents, a conservative allowance of 10:1 dilution for discharges to the Bay is necessary for protection of beneficial uses. The basis for limiting the dilution credit is based on SIP provisions in Section 1.4.2. The following outlines the basis for derivation of the dilution credit.

- a. A far-field background station is appropriate because the receiving waterbody (Bay) is a very complex estuarine system with highly variable and seasonal upstream freshwater inflows and diurnal tidal saltwater inputs.
- b. Due to the complex hydrology of the San Francisco Bay, a mixing zone cannot be accurately established.
- c. Previous dilution studies do not fully account for the cumulative effects of other wastewater discharges to the system.
- d. The SIP allows limiting a mixing zone and dilution credit for persistent pollutants (e.g., copper, silver, nickel and lead).

The main justification for using a 10:1 dilution credit is uncertainty in accurately determining ambient background and uncertainty in accurately determining the mixing zone in a complex estuarine system with multiple wastewater discharges. The detailed rationale is described in the Fact Sheet."

4. Amend Finding 34.b. as follows,

34.35.b. On May 23, 2001, the Discharger submitted "NPDES Feasibility Analysis for Achievement of Projected Final Effluent Limits for EBMUD Main Wastewater Treatment Plant." Based on the information in this report, Board staff believes that the Discharger has fulfilled all of the above requirements and is eligible for compliance schedules for copper, cyanide, mercury, and dioxin, 4,4-DDE and dieldrin. Furthermore, the schedules established in this Order are as short as practicable.

5. Amend Findings 35.c.(1), (2), and 35.d as follow,

~~35.~~36.c. *Summary of RPA Determinations*

(1) *Reasonable Potential*. Based on the RPA, the following constituents have been found to have reasonable potential to cause or contribute to an excursion above water quality objectives: chromium, copper, lead, mercury, nickel, silver, zinc, cyanide, dioxins and furans, ~~bis(2-ethylhexyl)phthalate~~, 4,4'-DDE, and Dieldrin. Based on the RPA, numeric effluent limits are required to be included in the permit for these constituents.

(2) *No Reasonable Potential*. Based on the RPA, the following constituents have been found to not show reasonable potential to cause or contribute to excursion above applicable water quality objectives: arsenic, cadmium, selenium, tributyltin and all the constituents under U.S. EPA methods 624, 625 and 608 ~~with the exception of bis(2-ethylhexyl)phthalate~~. Based on the RPA and continued consistent plant performance, effluent limits for these constituents are not needed at this time and are not included in this permit.

35. ~~35.~~36.d. Table for Specific RPA Determinations, the row for bis(2-ethylhexyl)phthalate as below,

Constituent	Maximum Observed Concentration, or Lowest Detection Level if not detected	Water Quality Objective	Reasonable Potential
Bis(2-ethylhexyl)phthalate	83 <del>4.0</del>	5.9	<del>Y</del> <u>N</u>

6. In accordance with Order No. WQO 2002-012, Conclusion No. 19, amend Finding 39.c as follow,

39 ~~40.~~40.c. To assist the Board in developing the TMDL, the Discharger ~~shall~~ may participate in a ~~special study-coordinated efforts through RMP~~ (e.g., through BACWA and the RMP) to investigate the feasibility and reliability of different methods of increasing sample volumes to lower the detection limits for dioxins ~~and furan compounds~~. Furthermore, the Discharger ~~shall have the preferred method, and to present the preferred method approved for approval~~ by U.S. EPA.

7. Remove Finding No. 41 in Order No. 01-072.

***Bis (2-ethylhexyl) phthalate***

41. ~~Phthalates are plasticizers which are environmentally persistent, resistant to treatment processes, and prone to undergo bioaccumulation. Pursuant to Section 1.4.2.1 of the SIP, "dilution credit may be limited or denied on a pollutant by pollutant basis..." Given that~~

bis(2-ethylhexyl) phthalate is bioaccumulative, based on best professional judgment, dilution credit is not included in calculating the WQBEL. Based on the Feasibility Analysis submitted by the Discharger, EBMUD cannot meet the calculated WQBEL. Therefore, an interim performance based effluent limit and a compliance schedule are included in this permit.

8. Amend Finding 61 in Order No. 01-072 as follows:

61. For bis(ethylhexyl)phthalate, copper, mercury, cyanide, 4,4-DDE, dieldrin, and dioxin/furans, the Discharger will conduct any additional source control or pollutant minimization measures in accordance Provision F.12 of this Order. These requirements are separate from those in with California Water Code 13263.3 and Section 2.1 of the SIP. Section 13263.3 establishes a separate process outside of the NPDES permit process for preparation, review, approval, and implementation of such source control and pollutant minimization measures.

## B. Amendments To Prohibition

9. In accordance with Order No. WQO2002-012, Conclusion No. 21, delete Prohibition A.5

~~A.5. — Discharge of water, materials, or wastes other than stormwater, which are not otherwise authorized by an NPDES permit, to a storm drain system or water of the State is prohibited.~~

## C. Amendment To Effluent Limits

10. Remove the limit for bis(2-ethylhexyl)phthalate from Provision C.2, and remove final limits for 4,4-DDE and dieldrin and replace them with interim monthly limits as shown in table below:

**Toxic Substances:** The effluent shall not exceed the following limits (1) (7):

Constituent	Daily Maximum	Monthly Average	Interim Daily Maximum	Interim Monthly Average	Units	Notes
a. Chromium VI	110				µg/L	(3)
b. Copper			37		µg/L	(1)(8)
c. Lead	53	37			µg/L	(1)
d. Mercury				87	ng/L	(1)(2)(6)
e. Nickel	59	34			µg/L	(1)
f. Cyanide			10		µg/L	(1)(5)
g. Silver	23	12			µg/L	(1)
h. Zinc	589	460			µg/L	(1)
i. <del>Bis (2-ethylhexyl) phthalate</del>				102	µg/L	(1)(10)
j. 4,4-DDE	<del>1.2</del>	<del>0.59</del>		50	ng/L	(1)(10)
k. Dieldrin	<del>0.28</del>	<del>0.14</del>		10	ng/L	(1)(10)
l. TCDD Equivalent				0.14	pg/L	(4)(6)(9)

Footnotes: Footnotes are unchanged by this amendment except for replacing footnote (10) content as stated below,

“(10) These interim limits shall remain effective until September 30, 2006. However, during the next permit re-issuance, Board staff may re-evaluate the interim limit.”

11. Amend Provision F.17 of Order No. 01-072 as follows:

17. SSO / TMDL Participation Requirement: The Discharger shall participate in the development of a TMDL or SSO for copper, mercury, cyanide, 4,4-DDE, dieldrin, and dioxin/furans. By January 31 of each year, the Discharger shall submit an update to the Board to document progress made on source control and pollutant minimization measures and development of TMDL or SSO.

#### D. Amendments To Self-Monitoring Program

12. In accordance with Order No. WQO 2002-012, Conclusion 24, add footnote j.) to Table 2 of the Self-Monitoring Program as follows:

"j.) Measurement for 1,2-Diphenylhydrazine may use azobenzene as a screen: if azobenzene measured at >1 ug/l, then analyze for 1,2-Diphenylhydrazine."

#### E. Amendments To Fact Sheet

13. Amend the row for bis(2-ethylhexyl)phthalate in the table under item II.A.3. of the Fact Sheet as follows:

Constituent	Maximum Observed Concentration, or Lowest Detection Level if not detected	Water Quality Objective
Bis(2-ethylhexyl)phthalate	<del>83</del> <u>4.0</u>	5.9

14. Amend Table for Summary of Effluent Limit Calculation in item IV.B.8.b.(4) as shown below: Removing the row for bis(2-ethylhexyl)phthalate and replacing final limits for 4,4-DDE and dieldrin with interim limits.

Constituent	Daily Maximum	Monthly Average	Interim Daily Maximum	Interim Monthly Average	Basis
<del>i. Bis (2-ethylhexyl) Phthalate (ug/L)</del>		<del>5.9</del>			<del>SIP, CTR</del>
m. 4,4-DDE (ng/L)	<del>1.2</del>	<del>0.59</del>		50	SIP, CTR,
n. Dieldrin (ng/L)	<del>0.28</del>	<del>0.14</del>		10	SIP, CTR

15. Revise item IV.B.8.c. as follow:

- c. *Effluent Limits Proposed to be Included in the Permit:* Based on RPA, chromium, copper, lead, mercury, nickel, cyanide, silver, dioxin TEQ, Zinc, ~~bis (2-ethylhexyl) phthalate~~, 4,4-DDE, and dieldrin have been found to have reasonable potential to cause or contribute to exceedance of water quality objectives. Please see Attachments for calculations.

16. Delete items IV.B.12, 13 and 14.

~~12. Bis(2-ethylhexyl)phthalate Further Discussion and Rationale for Effluent Limit:~~

~~———— Bis (2-ethylhexyl) phthalate is bioaccumulative. Therefore, even though there is no background value, a final WQBEL can still be calculated using dilution ratio (D) of zero. Based on comparison of the MEC, Minimum Level (ML) and calculated AMEL for bis(2-ethylhexyl)phthalate, the Discharger can comply with the water quality-based effluent limit based on compliance with commercially available analytical MLs specified in the SIP. Therefore, the compliance schedule originally proposed in the T.O. is not necessary.~~

~~13. **Dieldrin — Further Discussion and Rationale for Effluent Limits:**~~

~~———— Based on comparison of the MEC, Minimum Level (ML) and calculated AMEL for Dieldrin, the Discharger can comply with the water quality-based effluent limit based on compliance with commercially available analytical MLs specified in the SIP. Therefore, the compliance schedule originally proposed in the T.O. is not necessary.~~

~~14. **4,4-DDE Further Discussion and Rationale for Effluent Limits:**~~

~~———— Based on comparison of the MEC, Minimum Level (ML) and calculated AMEL for 4,4-DDE, the Discharger can comply with the water quality-based effluent limit based on compliance with commercially available analytical MLs specified in the SIP. Therefore, the compliance schedule originally proposed in the T.O. is not necessary.~~

**F. Order Effective and Expiration Dates**

This Order shall become effective on October 1, 2003 and expires on June 30, 2006.

I, Loretta K. Barsamian, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on September 17, 2003.



LORETTA K. BARSAMIAN  
Executive Officer

Attachment: Fact Sheet

**CALIFORNIA REGIONAL WATER QUALITY CONTROL REGIONAL BOARD**

**SAN FRANCISCO BAY REGION**

**FACT SHEET**

**for**

**AMENDMENT TO NPDES PERMIT and WASTE DISCHARGE REQUIRMENTS FOR:**

**EAST BAY MUNICIPAL UTILITY DISTRICT**

**SPECIAL DISTRICT NO. 1, WATER POLLUTION CONTROL PLANT**

**OAKLAND, ALAMEDA COUNTY**

**NPDES PERMIT NO. CA0037702**

## **PUBLIC NOTICE:**

### **Written Comments**

- Interested persons are invited to submit written comments concerning this draft permit amendment. The comments should be sent to 1515 Clay Street, Suite 1400, Oakland, CA 94612. Attention, Jenny Chen.
- Comments must be received by the California Regional Water Quality Control Board, San Francisco Region (the Regional Board) no later than 5:00 p.m. on September 2, 2003.

### **Public Hearing**

- The Tentative Order will be considered for adoption by the Regional Board at a public hearing during the Regional Board's regular monthly meeting at: Elihu Harris State Office Building, 1515 Clay Street, Oakland, CA; 1st floor Auditorium.
- This meeting will be held on: September 17, 2003, starting at 9:00 am.

### **Additional Information**

- For additional information about this matter, interested persons should contact Regional Board staff member **Ms. Jenny Chen, Phone: (510) 622-2485; email: jc@rb2.swrcb.ca.gov**

## **I. INTRODUCTION**

This Fact Sheet contains information regarding an amendment to the Waste Discharge Requirements and National Pollutant Discharge Elimination System (NPDES) permit for East Bay Municipal Utility District, Special District No. 1 (EBMUD, the Discharger) for discharges from its secondary level wastewater treatment plant. This Fact Sheet describes the factual, legal, and methodological basis for the proposed permit amendment and provides supporting documentation to explain the rationale and assumptions used in deriving the limits contained in the permit amendment.

This Order is to amend the Board's Order No. 01-072 to 1) comply with State Board's Order No. WQO 2002-0012, and 2) reflect new information on bis(2-ethylhexyl)phthalate, and on compliance determination at minimum levels that was not available at the time Order No. 01-072 was adopted.

### **A. Discharge Description**

The Discharger owns and operates the East Bay Municipal Utility District, Special District No. 1 wastewater treatment plant, located at 2020 Wake Avenue in Oakland. The plant provides secondary treatment of wastewater from domestic, commercial and industrial sources from the cities of Albany, Alameda, Berkeley, Emeryville, Oakland, Piedmont, and Stege Sanitary District.

### **B. Discharge Point**

The treated wastewater is discharged through a submerged diffuser adjacent to the San Francisco-Oakland Bay Bridge about 5,664 feet off shore at a depth of 45 feet below mean lower low water (Longitude 122 deg., 20 min., 55 sec.; Latitude 37 deg., 49 min., 2 sec.).

## **II. Rationale For Removing Bis(2-ethylhexyl)phthalate Limit**

The Discharger indicated in its petition to State Board for renewal of Order No. 01-072 that the effluent data used to conduct reasonable potential analysis in Order No. 01-072 are invalid. There was likelihood of sample contamination. The remand order allows the Discharger to provide new evidence on bis(2-ethylhexyl)phthalate in its effluent. If the new evidence shows that there is no reasonable potential for bis(2-ethylhexyl)phthalate, a final limit is not necessary.

Bis(2-ethylhexyl)phthalate is a plasticizer, which exists in many plastic products. Analysis of the original data, which Board staff used to conduct reasonable potential analysis during development of Order No. 01-072, indicates that the original data are invalid due to sample contamination from plastic sampling pipes or latex gloves used at laboratory. There were a total of eight data points that exceed the water quality objective of 5.9 µg/L (see the highlighted section of the attached). Among the eight samples with high concentrations, seven are composite samples, which individual grabs were combined at the end of a compositing protocol. This suggests that samples might be contaminated during the compositing process. The one grab sample with high result was taken from plastic tubing going to the bioassay test tank.

The Discharger conducted a bis(2-ethylhexyl)phthalate Special Study on their effluent from October 22, 2002 to January 9, 2003. Attached Table 2 gives the special study results. All results that met the data quality objectives were less than 5.9 µg/L, the water quality objective (see Attachment 3 for Final Report on Special Study of bis(2-ethylhexyl)Phthalate for method of determining data quality objective) for bis(2-ethylhexyl)phthalate. This Special Study indicates there is no reasonable potential for bis(2-ethylhexyl)phthalate in the Discharger's effluent.

The Board proposes to amend Order No. 01-072 to state that there is no reasonable potential for bis(2-ethylhexyl)phthalate, and to remove the effluent limit for it. This modification of permit requirements is made in accordance with 40 CFR 122.62(a)(2) in consideration of the new information provided by the Discharger.

## **III. Rationale for Replacing Final Limits for 4,4-DDE and Dieldrin with Interim Limits**

Order No. 01-072 established final water quality based effluent limits (WQBEL) for 4,4-DDE and dieldrin. These limits were based on reasonable potential trigger 2, which determines that limits are necessary if ambient background is above the criteria. EBMUD requested a compliance schedule in a letter report dated May 23, 2001. Their case was that the effluent was non-detect for these pesticides. But with the detection levels above the WQBELs, it was infeasible to demonstrate immediate compliance with the final WQBELs. The Board rejected this request because U.S. EPA comments dated May 24, 2001. U.S. EPA states:

"Under SIP procedures, the data shows the discharger in compliance; non-detects are treated as zero, so the discharger could meet any limitation. It is unclear to us how the discharger will be able to show infeasibility, if in fact the SIP defines the discharger as being in compliance."

In an October 2002 appellate court ruling (*WaterKeepers vs. SWRCB*), however, the court ruled that the SIP does not define the discharger as being in compliance when data are below SIP "Minimum Levels" (based on analytical quantification levels). This ruling, therefore, removes the basis for

U.S. EPA's comment on – and the Board's resulting rejection of – EBMUD's compliance infeasibility determination.

As such, in light of the appellate court decision, the Board concurs with EBMUD's May 23, 2001, demonstration of infeasibility to achieve immediate compliance with the WQBELs for 4,4-DDE and dieldrin. The Board proposes to replace the final limits in Order No. 01-072 with the interim limits at the lowest level EBMUD can feasibly demonstrate compliance: the Minimum Levels in the SIP. This modification of permit requirements is made in accordance with 40 CFR 122.62(a)(15) to correct a mistaken interpretation of 2.4.5 Compliance Determination in the SIP.

The table below shows the discharge's minimum detection limits, water quality objectives, final WQBELs from Order No. 01-072, and the proposed interim limits based on Minimum Levels.

	<b>4,4-DDE</b>	<b>Dieldrin</b>
Minimum Detection Limit in Discharge, µg/L	0.0011	0.0013
Water Quality Objective, µg/L	0.00059	0.00014
Daily Max. Limit in Order No. 01-072, µg/L	0.0012	0.00028
Monthly Avg. Limit in Order No. 01-072, µg/L	0.00059	0.00014
Minimum Levels in SIP, and Proposed Interim Limits, µg/L	0.05	0.01

#### **IV. Rationale for Other Amendments to Findings**

Order No. WQO 2002-0012 remanded certain issues for reconsideration or clarification. The changes address the last sentence of full paragraph on page 16 of Order No. WQO 2002-0012 and Conclusion Nos. 13, 16, 19, 21 and 24 of Order No. WQO 2002-0012. These are as follows:

The last sentence of the full paragraph on page 16 of Order No. WQO 2002-0012 reads:

“If the Regional Board rejects the conclusions of the District's dilution study based on uncertainty, the Regional Board must articulate the sources of uncertainty and indicate what additional kinds of evidence or analysis would be required to eliminate the uncertainty.”

The Amendment adds language to the Finding and Fact Sheet to clarify the basis for limiting the dilution credit to 10:1.

The main justification for using a 10:1 dilution credit is uncertainty in accurately determining ambient background and uncertainty in accurately determining the mixing zone in a complex estuarine system with multiple wastewater discharges.

- a. **Complex Estuarine System Necessitates Background** - The SIP allows background to be determined on a discharge-by-discharge or water body-by-water body basis (SIP section 1.4.3). Consistent with the SIP, Board staff has chosen to use a water body-by-water body basis because of the uncertainties inherent in accurately characterizing ambient background in a complex estuarine system on a discharge-by-discharge basis.

With this in mind, the Yerba Buena Island and Richardson Bay Stations fit the guidance for ambient background in the SIP compared to other stations in the Regional Monitoring Program.

The SIP states that background data are applicable if they are "representative of the ambient receiving water column that will mix with the discharge." Board staff believe that data from these stations are representative of water that will mix with the discharged from EBMUD's outfall. Although these stations are located near the Golden Gate, they would represent the typical water flushing in and out the Bay area each tidal cycle. For most of the Bay Area, the waters represented by these stations make up a large part of the receiving water that will mix with the discharge.

- b. **Uncertainties Prevent Accurate Mixing Zones in Complex Estuarine System** - There are uncertainties in accurately determining the mixing zones for each discharge. The models that have been used by dischargers to predict dilution have not considered the three-dimensional nature of the currents in the estuary resulting from the interaction of tidal flushes and seasonal fresh water outflows. Salt water is heavier than fresh water. Colder salt water from the ocean flushes in twice a day generally under the warmer fresh rivers waters that flows out annually. When these waters mix and interact, complex circulation patterns occur due to the different densities of these waters. The location changes are depending on the strength of each tide and the variable rate of delta outflow. Additionally, sediment loads to the Bay from the Central Valley also change on a longer-term basis. These changes can result in changes to the depths of different parts of the Bay making some areas more shallow and/or other areas more deep. These changes affect flow patterns that in turn can affect the initial dilution achieved by a Discharger's diffuser.
- c. **Dye studies do not account for cumulative effects from other discharges** - The tracer and dye studies conducted are often not long enough in duration to fully assess the long residence time of a portion of the discharge that is not flushed out of the system. In other words, some of the discharge, albeit a small portion, makes up part of the dilution water. So unless the dye studies are of long enough duration, the diluting effect on the dye measures only the initial dilution with "clean" dilution water rather than the actual dilution with "clean" dilution water plus some amount of original discharge that resides in the system. Furthermore, both models and dye studies that have been conducted have not considered the effects of discharges from other nearby discharge sources, nor the cumulative effect of discharges from over 20 other major dischargers to San Francisco Bay system. While it can be argued the effects from other discharges are accounted for by factoring in the local background concentration in calculating the limits, accurate characterization of local background levels are also subject to uncertainties resulting from the interaction of tidal flushing and seasonal fresh water outflows described above.
- d. **Mixing Zone Is Further Limited for Persistent Pollutants** - Discharges to the Bay Area waters are not completely-mixed discharges as defined by the SIP. Thus, the dilution credit should be determined using site-specific information for incompletely-mixed discharges. The SIP in section 1.4.2.2 specifies that the Regional Board "significantly limit a mixing zone and dilution credit as necessary... For example, in determining the extent of... a mixing zone or dilution credit, the RWQCB shall consider the presence of pollutants in the discharge that are...persistent." The SIP defines persistent pollutants to be "substances for which degradation or decomposition in the environment is non-existent or very slow." The pollutants at issue here are persistent pollutants (e.g., copper, lead nickel). The dilution studies that estimate actual dilution do not address the effects of these persistent pollutants in the Bay environment, such as their long-term effects on sediment concentrations."

Conclusion 13. "Although the Regional Board properly denied dilution credits for mercury, TCDD equivalents, dieldrin, and 4,4-DDE, the Regional Board must amend the permit Findings to refer to the studies documenting bioaccumulation related impairment for these pollutants."

The Amendment amends Findings to reference the Studies.

Conclusion 16. "The Regional Board properly included daily maximum effluent limitations in the permit to protect against acute water quality effects. However, the Regional Board must include a finding in the permit on remand explaining the impracticability of weekly average limits."

The Amendment adds a finding to explain the impracticability of weekly average limits.

Conclusion 19. "The Regional Board must either amend Finding 39.c to delete the language mandating participation in a study through the RMP or include a permit provision that sets forth the options discussed in the August 6, 2001 letter from the Regional Board."

The Amendment revises Finding 39.c.

Conclusion 21. "A prohibition against unpermitted discharges to storm drain systems or other waters of the state may only be included in permits if the prohibition is interpreted to mean that it only applies to constituents that are not anticipated in the discharge, and have not been disclosed by the discharger. On remand the Regional Board must include clarifying language in a footnote to Prohibition A.5 that reflects this interpretation."

The Amendment deletes Prohibition A.5 to avoid the various ways Order No. WQO 2001-0012 can be misinterpreted. Prohibition A.5 is unnecessary because Order No. 01-072 specifies another prohibition that satisfies A.5's intent. Prohibition A.1 states "the discharge of treated wastewater at locations or in a manner different from that described in the Findings of this Order is prohibited, except as noted in Prohibition A.4."

Conclusion 24. "The Regional Board must amend the Monitoring Program in accordance with its letter that agreed to accept azobenzene as a surrogate for DPH."

The Amendment revises the Monitoring Program.

The language in the revised Findings is consistent with language in permits recently issued by the Board.

## **V. WASTE DISCHARGE REQUIREMENT APPEALS**

Any person may petition the State Water Resources Control Board to review the decision of the Regional Board regarding these Waste Discharge Requirements. A petition must be made within 30 days of the Board public hearing.

- Attachments
1. Final Study Results-bis(2-ethylhexyl)phthalate
  2. Original bis(2-ethylhexyl)phthalate Data
  3. Final Report on Special Study of Bis(2-ethylhexyl)Phthalate (Attachments II through VI are not enclosed. They are posted in our website at [www.swrcb.ca.gov/rwqcb2](http://www.swrcb.ca.gov/rwqcb2))

Table 1 Original Bis(2-Ethylhexyl)Phthalate Data

## BIS(2-ETHYLHEXYL)PHTHALATE (ug/L)

Wastewater Treatment - Effluent  
Method - EPA 625

Collect Date	Sample ID	Locator	Sample Type	Results	Method Blank	MDL	RL/ML	Sample Comments
14-Jul-99	L74682-9	EFF EPS	CF02	B 83	9	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
23-Jul-97	L48233-2	EFF EPS	CF02	B 61	5.6	0.5		624 & 625
14-Jul-98	L62624-1	EFF EPS	CF02	B 40	0.77	0.5		1/4LY ORG; 8 GRABS COMPOSITED IN THE LAB
23-Nov-98	L68255-2	EFF EPS LAB	CF03	9.9	U 0.5	0.5		Sample taken from flow-through bioassay test tank
22-Oct-99	L77081-6	EFF EPS	CF02	B 9.8	1.3	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
26-Jul-00	L83307-9	EFF EPS	CF02	N,B 8.2	9.3	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
04-Oct-01	L92789-11	EFF EPS 04	CFV	B 5.8	E 2.3	0.5	5	COMP IN EBMUD LAB; 624 deleted on 10-18-01 because not necessary and analysis had not been preformed, please refer to L92986 for appropriate data
10-Feb-97	L41183-9	EFF EPS	CF02	U 5	U 0.5	0.5		BPM samples
26-Jan-00	L79204-9	EFF EPS	CF02	B 4.2	4.4	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
18-Jan-01	L87204-9	EFF EPS	CF02	B 3.2	0.62	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
20-Apr-00	L81214-9	EFF EPS	CF02	2.8	U 0.5	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
12-Jul-01	L91090-4	EFF EPS 04	COMP	E 2.8	U 0.5	0.5	5	624,625,CN - comp in lab;defined container poured out at sample control upon compositing
16-Apr-98	L59141-1	EFF EPS	CF02	B 2.7	1.1	0.5		1/4LY ORGANICS COMPOSITED IN LAB
07-Oct-97	L51327-1	EFF EPS	CF02	B 2.6	34	0.5		1/4ly org composited in lab
26-Apr-01	L89435-7	EFF EPS 04	CF02	J 2.2	U 0.5	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
14-Jan-97	L40100-2	EFF EPS	CF02	2	U 0.5	0.5		qtrly org
24-Oct-00	L85390-9	EFF EPS	CF02	B 1.9	0.53	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
09-Apr-97	L43720-10	EFF EPS	CF02	1.8	U 0.5	0.5		no sample for 624 collected at 2000
14-Apr-99	L72527-8	EFF EPS	CF02	B 1.8	1.1	0.5		16 containers (VOA4A & ANORT) received for compositing to ONE sample; defined containers poured off at sample control at the end of the compositing protocol
14-Jan-98	L55238-1	EFF EPS	CF02	B 1.4	1.8	0.5		day 4 org composite in lab
12-Jan-99	L70126-9	EFF EPS	CF02	1.2	U 0.5	0.5		day 2 quarterly organics composited in lab; no 1 L amber for 2010.
18-Oct-98	L66732-1	EFF EPS	CF02	1.1	U 0.5	0.5		1/4ly organics composited in lab
08-Dec-98	L68767-1	EFF EPS ?	GRAB	B 32	1.5	0.5		Sample flushed from the tubing going to the test tanks
06-Feb-02	L95140-1	EFF EPS 04	GRAB	E,B 4.7		0.5	5	13267 data for Feb 2002
03-Apr-02	L96260-2	EFF EPS 04	GRAB	E,B 1.6	E 1.1	0.5	5	P2
09-Dec-98	L68818-3	EFF EPS	GRAB	1.7	U 0.5	0.5		sample from composite sampler; flow=65 MGD
09-Dec-98	L68818-2	EFF EPS ?	GRAB	1.7	U 0.5	0.5		surface sample from final effluent channel; Flow=60 MGD
09-Dec-98	L68818-1	EFF EPS ?	GRAB	1.3	U 0.5	0.5		surface sample from final effluent channel; flow=65 MGD
09-Dec-98	L68818-4	EFF EPS	GRAB	1.2	U 0.5	0.5		sample from composite sampler; Flow=60 MGD
05-Dec-01	L93938-1	EFF EPS 04	GRAB	E 0.78	U 0.5	0.5	5	grabs collected between 12:19 and 12:39 by 2 samplers; flow=122 mgd per DLF at 12:55; data used for meeting 13267 and SMP requirements for year 2001
07-Aug-02	L98947-1	EFF EPS 04	GRAB	E,B 0.93	E 0.53	0.5	5	13267 SAMPLING AT PEAK FLOW; FLOW = 54
16-Oct-01	L92986-2	EFF EPS 04	GRAB	E 2.4	U 0.5	0.5	5	REAL QUARTERLY REQUIREMENT FOR P2 FLOW = 62.3 mgd

## BIS(2-ETHYLHEXYL)PHTHALATE (ug/L)

Wastewater Treatment Plant - Secondary  
Method - EPA 625

Collect Date	Sample ID	Locator	Sample Type	Results	Method Blank	MDL	RL/ML	Sample Comments
10-Nov-98	L67881-19	EFF PRECHLO	CTV	66	U 0.5	0.5		eot 8hr composite of 4 grabs
15-Oct-98	L66599-1	EFF PRECHLO	CTV	B 4.2	0.51	0.5		EOT INF org 8 HR COMP
01-Oct-98	L65683-1	EFF PRECHLO	CTV	B 3.8	2	0.5		EOT INF org 8 HR COMP
03-Dec-98	L68675-4	EFF PRECHLO	CTV	2.7	U 0.5	0.5		eot org 8hr composite of 4 grabs
19-Nov-98	L68208-4	EFF PRECHLO	CTV	2.4	U 0.5	0.5		eot org 8hr composite in in lab
30-Dec-98	L69595-2	EFF PRECHLO	CTV	1.8	U 0.5	0.5		eot ORG 8 HR comp in LAB
10-Dec-98	L68913-2	EFF PRECHLO	CTV	1.6	U 0.5	0.5		eot ORG 8 HR COMP of 4 GRABS
09-Dec-98	L68851-2	EFF PRECHLO	CTV	1.4	U 0.5	0.5		eot ORG 8 HR COMP of 4 GRABS
05-Nov-98	L67676-17	EFF PRECHLO	CTV	1.2	U 0.5	0.5		EOT org 8HR COMP OF 4 GRABS
25-Nov-98	L68381-4	EFF PRECHLO	CTV	B 1.2	0.73	0.5		eot org 8hr composite of 4 grabs
02-Dec-98	L68567-4	EFF PRECHLO	CTV	1.2	U 0.5	0.5		eot org 8 hr composite of 4 grabs
21-Oct-98	L67033-1	EFF PRECHLO	CTV	1.1	U 0.5	0.5		EOT INF org 8 HR COMP
18-Nov-98	L68151-4	EFF PRECHLO	CTV	1.1	U 0.5	0.5		eot org 8 hr composite of 4 grabs
29-Oct-98	L67315-1	EFF PRECHLO	CTV	0.95	U 0.5	0.5		eot ORG 8 HR COMP OF 4 GRABS
17-Dec-98	L69160-2	EFF PRECHLO	CTV	0.93	U 0.5	0.5		EOT 8 HR ORG COMP IN LAB
23-Dec-98	L69447-2	EFF PRECHLO	CTV	0.87	U 0.5	0.5		eot ORG 8 hr comp in lab
23-Sep-98	L65416-25	EFF PRECHLO	CTV	0.82	U 0.5	0.5		EOT INF org 8 HR COMP
16-Dec-98	L69125-2	EFF PRECHLO	CTV	0.82	U 0.5	0.5		EOT org 8HR COMPOSITE IN THE LAB
04-Feb-99	L71016-4	EFF PRECHLO	GRAB	B 2.5	3.8	0.5		THUR GRABS
13-Jan-99	L70231-1	EFF PRECHLO	GRAB	1.7	U 0.5	0.5		WED GRABS+coli
27-Jan-99	L70824-1	EFF PRECHLO	GRAB	1.6	U 0.5	0.5		WED GRABS+coli; pH=6.95
03-Feb-99	L70983-1	EFF PRECHLO	GRAB	B 1.6	3.8	0.5		WED GRABS+coli
06-Jan-99	L69877-1	EFF PRECHLO	GRAB	1.3	U 0.5	0.5		WED GRABS
28-Jan-99	L70851-1	EFF PRECHLO	GRAB	1.1	U 0.5	0.5		THUR GRABS
07-Jan-99	L69936-1	EFF PRECHLO	GRAB	0.91	U 0.5	0.5		THUR GRABS
21-Jan-99	L70520-1	EFF PRECHLO	GRAB	0.66	U 0.5	0.5		THUR GRABS; pH=6.73
19-Jan-99	L70411-1	EFF PRECHLO	GRAB	0.65	U 0.5	0.5		WED GRABS+coli; pH=6.78
15-Jan-99	L70353-1	EFF PRECHLO	GRAB	LA	U 0.5	0.5		pH=6.48; LA--Sample inadvertently spiked
CF02 = 24 hr flow weighted composite collected every 3 hours								
CF03 = 4-day flow composite continuous								
CTV = Time composited variable time								

**COMBINED** Max.: 83 34  
Min.: 0.65 U 0.5  
Mean: 6.9 1.8  
Median: 1.7 U 0.5  
Count: 59 59

**COMPOSITE** Max.: 83 34  
Min.: 0.82 U 0.5  
Mean: 8.7 2.2  
Median: 2.1 U 0.5  
Count: 40 40

Mean increases ~6x when compositing sample vs. grab sample

**GRAB** Max.: 32 3.8  
Max w/o High Value: 4.7 3.8  
Min.: 0.65 U 0.5  
Mean: 3.2 0.93  
Mean w/o High Value: 1.6 0.93  
Median: 1.6 U 0.5  
Count: 19 19

SITE: WWTP EFFLUENT  
 LOCATOR: EFF EPS 04  
 PARAMETER: BIS(2-ETHYLHEXYL)PHTHALATE  
 UNITS: ug/L

Table 2 Final Study Results-Bis(2-Ethylhexyl)Phthalate

	SAMPLE ID #	RUN ID #	DATE COLLECTED	SAMPLE RESULT	BLANK RESULT	LCS RESULTS	PERCENT RECOVERY	SPIKE BLANK RESULTS	PERCENT RECOVERY	DUPPLICATE RESULTS	RPD <sup>1</sup> DUPLICATES (Precision)	MS - MSD RESULTS	PERCENT RECOVERY	RPD <sup>2</sup> MS-MSD (Accuracy)
1	L100486-1	R108754	22-Oct-02	E 1.1	U 0.5									
	WG98094-1													
	WG98094-2					E 1.1	110%							
	WG98094-3							25	100%					
	WG98094-4									E 1.4	25%			
	WG98094-5									E 1.5	32%			
2	WG98094-8											E 4.6	14%	56%
	WG98094-9											7.3	25%	
	L100541-1	R108754	24-Oct-02	E 0.95						E 1.3	32%			
	WG98094-6									E 0.83	13%			
	WG98094-7													
3	L100611-1	R108796	27-Oct-02	E,N 0.98	U 0.5									
	WG98132-1													
	WG98132-2					E 1.2	120%							
	WG98132-3							25	100%					
	WG98132-4									E 0.97	1%			
	WG98132-5									E 1.9	63%			
4	WG98132-6											E,N 2.7	6.9%	21%
	WG98132-7											E 3.1	8.5%	
	L100693-1	R109036	30-Oct-02	E,N 0.84	U 0.5									
	WG98315-1													
	WG98315-2					E,N 3.9	390%							
	WG98315-3							20	80%					
5	WG98315-4									E 0.64	27%			
	WG98315-5									E 1.3	44%			
	WG98315-6											E,N 2.8	7.8%	84%
	WG98315-7											E 5.5	19%	
	L100751-1	R109036	01-Nov-02	E 0.64										
	WG98315-8									E 0.73	13%			
6	WG98315-9									E 0.74	14%			
	L100781-1	R109135	04-Nov-02	E,N 1.4	U 0.5									
	WG98404-1													
	WG98404-2					E,N 4.7	470%	19	76%					
	WG98404-3									E 1.5	5.6%			
	WG98404-4									E 1.2	16%			
	WG98404-5											E,N 3.3	7.6%	5.1%
	WG98404-6											E 3.4	8.0%	
	WG98404-7													

SITE: WWTP EFFLUENT  
 LOCATOR: EFF EPS 04  
 PARAMETER: BIS(2-ETHYLHEXYL)PHTHALATE  
 UNITS: ug/L

Table 2 Final Study Results-Bis(2-Ethylhexyl)Phthalate

	SAMPLE ID #	RUN ID #	DATE COLLECTED	SAMPLE RESULT	BLANK RESULT	LCS RESULTS	PERCENT RECOVERY	SPIKE BLANK RESULTS	PERCENT RECOVERY	DUPPLICATE RESULTS	RPD <sup>1</sup> DUPLICATES (Precision)	MS - MSD RESULTS	PERCENT RECOVERY	RPD <sup>2</sup> MS-MSD (Accuracy)
7	L101024-1	R109211	09-Nov-02	E 0.69	U 0.5									
	WG98513-1													
	WG98513-2					E 1.3	130%							
	WG98513-3							22	88%					
	WG98513-4									E 1.2	55%			
	WG98513-5									E 0.84	20%			
8	L101026-1	R109595	12-Nov-02	E 1.0	U 0.5									
	WG98667-1													
	WG98667-2					19	73%							
	WG98667-3							U 0.5	---					
	WG98667-4									E 4.0	120%			
9	L101129-1	R109595	15-Nov-02	E,N 0.57						E 1.1	6%	E 4.1	14%	68%
	WG98667-5											E,N 2.3	6.9%	
	WG98667-6													
	WG98667-7									E 0.7	21%			
										E 0.75	27%			
10	L101711-1	R110305	13-Dec-02	E 2.0	U 0.5									
	WG99513-1													
	WG99513-2					E 0.83	83%							
	WG99513-3							18	72%					
	WG99513-4									E 1.8	11%			
11	L101813-1	R110305	18-Dec-02	E,N 1.2						E 2.1	3.8%			0.0%
	WG99513-5											E,N 2.8	6.4%	
	WG99513-6											E,N 2.8	6.4%	
	WG99513-7									E 0.56	73%			
										E 0.59	68%			
12	L102180-1	R111066	09-Jan-03	E,N 1.3	U 0.5									
	WG100144-1													
	WG100144-2					E 0.95	95%							
	WG100144-3							17	68%					
	WG100144-4									E 1.6	20%			
	WG100144-5									E 2.5	62%			
	WG100144-6											E,N 2.9	6.4%	44%
	WG100144-7											E 3.8	10%	

SITE: WWTP EFFLUENT  
 LOCATOR: EFF EPS 04  
 PARAMETER: BIS(2-ETHYLHEXYL)PHTHALATE  
 UNITS: ug/L

Table 2 Final Study Results-Bis(2-Ethylhexyl)Phthalate

SAMPLE ID #	RUN ID #	DATE COLLECTED	SAMPLE RESULT	BLANK RESULT	LCS RESULTS	PERCENT RECOVERY	SPIKE BLANK RESULTS	PERCENT RECOVERY	DUPPLICATE RESULTS	RPD <sup>1</sup> DUPLICATES (Precision)	MS - MSD RESULTS	PERCENT RECOVERY	RPD <sup>2</sup> MS-MSD (Accuracy)
		MAXIMUM:	2.0	U 0.50	19	470%	25	100%	4.0	120%	7.3	25%	84%
		MINIMUM:	0.57	U 0.50	0.83	73.0%	0.50	68.0%	0.56	1.0%	2.3	6.4%	0.0%
		MEAN:	1.06	U 0.50	4.6	184%	19	83%	1.3	32%	3.7	11%	39%
		STD. DEV:	0.39	0.00	6.5	155%	8.4	13%	0.76	28%	1.5	6%	35%
		3 x STD. DEV:	1.18	0.00	20	464%	25	39%	2.3	85%	4.4	18%	105%
		UPPER CL:	2.24	0.50	24	647%	44	122%	3.5	118%	8.1	29%	144%

<sup>1</sup>DUPPLICATE RPD = Absolute Value of (Sample Result - Duplicate Result) / ((Sample Result + Duplicate Result)/2) x 100  
<sup>2</sup>MS-MSD RPD = Absolute Value of (((MS Result - Sample Result)/MS Concentration) - ((MSD Result - Sample Result)/MSD Concentration)) / ((MS Concentration + MSD Concentration)/2) x 100

RPD: Relative Percent Difference  
 MS: Matrix Spike  
 MSD: Matrix Spike Duplicate  
 LCS: Laboratory Control Sample  
 E: Estimated value, concentration outside calibration range. For SIP, E=DNQ (detected but not quantified), estimated concentration.  
 N: Spike recovery outside control limits

Jc

March 3, 2003

Ms. Loretta K. Barsamian, Executive Director  
San Francisco Bay - Regional Water Quality Control Board  
1515 Clay Street, Suite 1400  
Oakland, CA 94612

Dear Ms. Barsamian:

Re: Final Report on Special Study of Bis(2-ethylhexyl) Phthalate in EBMUD's Main  
Wastewater Treatment Plant Effluent

Enclosed are the results of East Bay Municipal Utility District's (EBMUD) special study on samples collected for bis(2-ethylhexyl) phthalate analysis from its Main Wastewater Treatment Plant (WWTP) final effluent to determine if its discharge exceeds the water quality objective (WQO). The purpose of this study was to assess whether historical WWTP effluent data were inappropriately subjected to the requirements of State Implementation Plan (SIP) Reasonable Potential Analysis (RPA), consequently resulting in an NPDES permit limit, in light of additional information suggesting that past results may not have accurately characterized EBMUD's final effluent.

### **Background**

In developing its 2001 NPDES permit, EBMUD submitted data to the Regional Water Quality Control Board (RWQCB) that included results for bis(2-ethylhexyl) phthalate that exceeded the WQO of 5.9 µg/L. Based upon these data, the RWQCB concluded that EBMUD had reasonable potential (RP) to exceed the bis(2-ethylhexyl) phthalate WQO and included an interim limit of 102 µg/L in the 2001 permit, with a final water quality based effluent limit (WQBEL) set at the WQO. In response to a District's appeal to the State Water Resources Control Board (SWRCB) to reconsider the RPA for bis(2-ethylhexyl) phthalate based upon questionable data used for the RP determination, the SWRCB remanded to the RWQCB that they consider any new information EBMUD might provide regarding bis(2-ethylhexyl) phthalate data quality concerns.

In a follow-up meeting on October 7, 2002 with RWQCB and EBMUD staff, EBMUD proposed to conduct a special study to assess the validity of the RWQCB's RP decision on bis(2-ethylhexyl) phthalate in light of sample handling and analysis concerns discussed at the meeting. Following is a brief description of the bis(2-ethylhexyl) phthalate study and the results.

## **Study Design**

The "Bis(2-ethylhexyl) Phthalate Special Study" used the approach recommended by EPA in its guidance manual, EPA Guidance for the Data Quality Objectives Process: EPA QA/G4, EPA/600/R-96/055, August 2000. Following this guidance, a committee of technical and operational staff was assembled to design, implement, and assess the results of the study. The data quality objectives (DQO) for bis(2-ethylhexyl) phthalate were established and documented [see Attachment I]. The EPA process incorporates seven steps that cover the following essential elements:

- 1) Project Logistics, Team and Schedule
- 2) Project Goals (i.e. "Is there reasonable potential for the Main WWTP effluent to exceed the WQO for bis(2-ethylhexyl) phthalate?").
- 3) Decision Inputs (sampling and analytical methods)
- 4) Boundaries of the Study
- 5) Decision Rules (i.e. "If this, then that")
- 6) Tolerance Limits on Decision Errors
- 7) Optimize the Design (i.e. evaluation and optimization based on interim data)

Historical data for bis(2-ethylhexyl) phthalate were reviewed and evaluated as part of this process. These data indicated that composite samples, sample handling in the field and laboratory, and laboratory analysis (by virtue of method blank information) contributed to false positives. Based upon this working hypothesis, a sampling SOP was developed for bis(2-ethylhexyl) phthalate [see Attachment II], and EPA Method 625, as detailed in Laboratory SOP #344 [see Attachment III] was used as the analytical method.

The sampling plan required that a minimum of ten samples be collected in triplicate over a 5-week period, at 2 samples per week, with at least one sample collected on each day of week. Data validation criteria [see Attachment IV] were developed prior to sample collection and analysis as part of the DQO process, and used in the evaluation of data generated by this Study. For example, sample results for the sample of record and its replicates were evaluated for precision based on the relative percent difference (RPD) among the samples' detectable concentrations. If the RPD exceeded the validation criteria, a new set of samples was collected for evaluation. Finally, a sampling schedule and Laboratory Service Request (LSR) was developed [see Attachment V] prior to the Special Study start-up. An LSR is used by the Laboratory to insure that analytical requirements are clearly documented for bench analysts and other technical staff.

## **Results**

Summary table of the sample and QA/QC results, statistical analyses and data qualifiers for the Study samples is provided [see Attachment VI]. Results for this Study show that:

- All results that met the DQOs were less than the WQO of 5.9 µg/L

Loretta K. Barsamian, Executive Director

March 3, 2003

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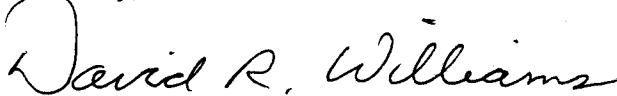
- The maximum value for the 36 results meeting DQOs (including the two replicate samples and the sample of record for each triplicate sample set) was: **E 4.0 µg/L**
- The minimum value for the 36 results meeting DQOs was: **E 0.56 µg/L**
- The mean of all values meeting DQOs was: **E 1.3 µg/L**

The "E" qualifier used with these data indicates the analytical results are considered estimates because they fall outside the analytical calibration range (i.e. in this case below the lowest calibration point on the calibration curve), and would be reported as detected not quantified (DNQ) for SIP purposes.

Based on these results and the historical data presented at the initial meeting with RWQCB staff following the SWRCB remand, the District does not believe there is reasonable potential for the Main WWTP effluent to exceed the WQO for bis(2-ethylhexyl) phthalate. EBMUD therefore requests that the RWQCB amend its NPDES permit to remove this compound from among its permitted constituents. EBMUD would like to discuss the data and conclusions resulting from the "Bis(2-ethylhexyl) Phthalate Special Study", and will be contacting RWQCB staff within two weeks to set a time and date for a meeting.

Please do not hesitate to contact me if you have any questions regarding the study plan, the protocols used, the results produced, and/or the conclusions reached.

Sincerely,



DAVID R. WILLIAMS  
Director of Wastewater

DRW:WME:akg

Attachments

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# **ATTACHMENT I**

## **Data Quality Objectives Process for Bis-(2ethylhexyl) Phthalate**

# **Data Quality Objectives Process for EBMUD**

## **Bis-(2-ethylhexyl) Phthalate RPA study**

### **1. Problem Statement**

Bis-(2-ethylhexyl) phthalate is an environmentally ubiquitous compound used as a plasticizer in many types of plastic, especially PVC. It is a priority pollutant under the California Toxics Rule and is considered to be bio-accumulative. One can expect to find it associated with particulate matter in the effluent due to low solubility in water. Review of the previously collected effluent monitoring data shows much higher levels of bis-(2-ethylhexyl) phthalate in composite samples in which the sample contacted plastic tubing during sample collected and also shows varying levels of blank contamination. Based on this, a working hypothesis was developed that theorized that while bis-(2-ethylhexyl) phthalate may be present at very low levels in EBMUD's effluent, its measurement is unusually subject to errors due to contamination during sampling or analysis.

The Water Quality Objective (WQO) used by the Regional Water Quality Control Board (RWQCB) to determine effluent limits for bis-(2-ethylhexyl) phthalate is 5.9 ug/L. In the course of the last permit renewal for EBMUD's Main WWTP NPDES permit, the District submitted data to the RWQCB that included results for bis-(2-ethylhexyl) phthalate that exceeded the WQO. As a result, the RWQCB's Reasonable Potential Analysis concluded the District had reasonable potential to exceed the WQO and the RWQCB included an interim monthly average limit of 102 ug/L in EBMUD's 2001 permit, with a final Water Quality-Based Effluent Limit (WQBEL) to be set in the future. In response to the District's appeal of various aspects of the 2001 permit the State Board ordered the RWQCB to reconsider the reasonable potential for bis-(2-ethylhexyl) phthalate in the light of any new evidence the District may produce.

The RWQCB has agreed that the District should to conduct a special study of bis-(2-ethylhexyl) phthalate in the Main WWTP effluent, taking precautions to avoid contamination during sample collection and analysis, in order to determine if the District has reasonable potential to exceed the WQO for bis-(2-ethylhexyl) phthalate.

### **Planning Team and Decision-Makers**

The following departments are identified as the main stakeholders in this project and their roles in the project, with their current representatives identified in parenthesis:

- Regulatory Compliance: Overall project coordination, including data review (Dan Jackson and Jennifer Smith)
- Laboratory Services: Sample analysis and data validation (Julia Halsne, Francois Rodigari, Bill Ellgas)
- Source Control: Sample collection (Ben Horenstein, Dan Kimm, Ray Maxwell)
- Wastewater Operations: NPDES Permit holder (Dave Freitas, Kurt Haunschild).

The RWQCB is the ultimate decision-maker for the reasonable potential determination. The above DQO planning committee identified itself as the body authorized to commit District resources to collect and analyze samples after an acceptable study design has been formulated. It

also identified the Director of Wastewater as the person responsible for the decision to submit the resulting information to the RWQCB.

### Resources, Constraints and Deadlines

The resources to conduct the study are limited by the availability of Field Services personnel to collect the samples and the ability of the Laboratory to process the samples. There is no firm deadline for the study, however the RWQCB was most interested in data from dry weather flow periods, so the samples should be collected in October and early November if possible. However, this does not preclude samples from being collected during the wet weather season.

## **2. Decision Statement**

The principle purpose of the study is to determine if there is a reasonable potential for the Main WWTP effluent to exceed the WQO for bis-(2-ethylhexyl) phthalate.

## **3. Decision Inputs**

The District will collect and analyze new samples. The Action Level is equal to the WQO of 5.9 ug/L. If the maximum effluent concentration in the data set exceeds this level, the decision will be that reasonable potential exists.

### Sampling, Analysis and Reporting Guidelines

Samples will be collected in accordance with the ESOP "Sampling Procedures for Semivolatile Organic Constituents to Mitigate Potential Field Contamination." All samples will be collected as grab samples.

Samples will be analyzed by EPA Method 625, following Laboratory SOP #344 "Semi-volatile Organics by GC/MS EPA Method 625", using the pre-established data validation criteria developed and documented by the Planning Team.

As discussed above, analysis for bis-(2-ethylhexyl) phthalate is subject to possible sample contamination. Therefore, samples are to be analyzed in triplicate and results in which the relative percent difference (RPD) between the triplicate samples exceeds 99% confidence levels will be rejected and resampled. After the first eight samples were collected, a statistical analysis of the data indicated that if the triplicates were within 60% RPD they were within the 99% confidence limits. The laboratory will flag any sample and duplicates with "Q" if they are outside that limit to indicate that such results did not meet data quality objectives and such flagged data will not be reported with the validated study data.

All validated data from samples collected and analyzed using the above procedures will be reported to the RWQCB as part of the RPA study. Any effluent samples collected and analyzed for EPA 625 using methods that do not conform to the above procedures will not be included in the study results.

#### **4. Boundaries of the Study**

The target population of the study is the set of grab effluent samples collected for the study.

Samples will be collected from the normal effluent sampling point, the sample sink at EFF 04. This sampling station consists of chlorinated final effluent that is continuously pumped by peristaltic pump and conveyed through PVC pipe to a continuously-flowing sample sink. Any samples that have come in contact with new plastic tubing or PVC pipe that has not been flushed for 24 hours will be deemed invalid for the purposes of this study.

Samples will be collected at 1300 hours (peak flow) on different days of the week according to the attached sampling schedule.

The scale of decision-making is the individual effluent sample.

#### **5. Develop a Decision Rule**

The population parameter in this case is the maximum value in the data set, as the RWQCB defines "maximum effluent concentration". The Action Level is the WQO of 5.9 ug/L. The secondary population parameter is the mean value of the set of samples collected within a given month.

The Decision Rule is: "If the maximum effluent concentration of bis-(2-ethylhexyl) phthalate exceeds 5.9 ug/L, then reasonable potential exists for the District to contribute to an excursion above the Water Quality Objective." The secondary Decision Rule is: "If the mean value of the samples collected during a given month exceeds 102 ug/L, then the District is in violation of the interim permit limit."

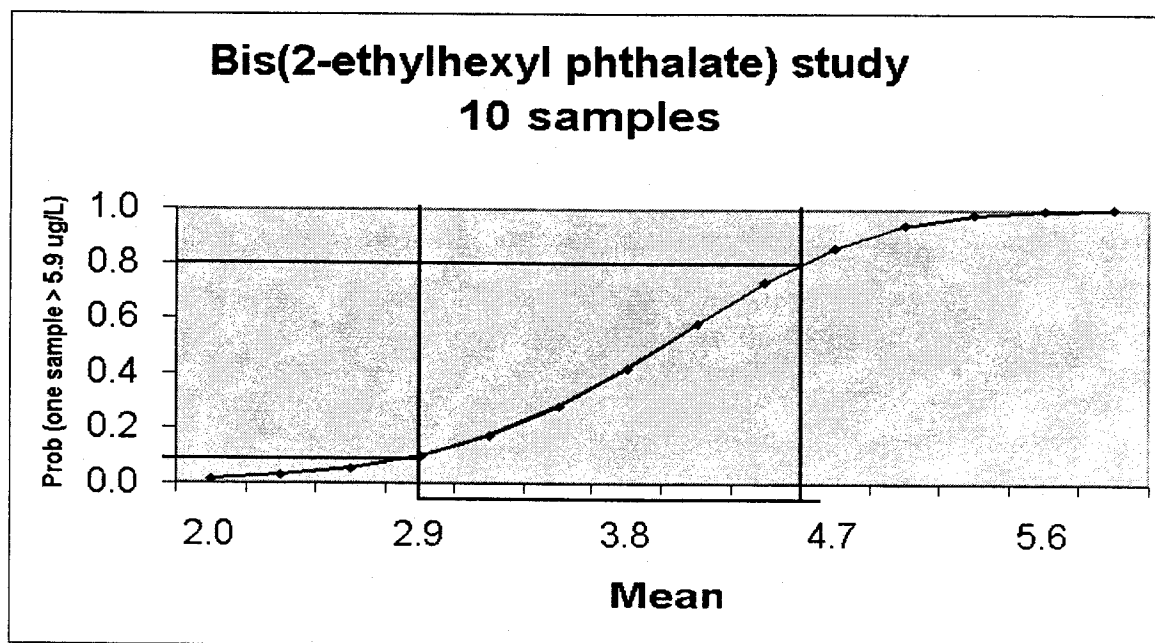
#### **6. Specify Tolerable Limits on Decision Errors**

Sources of error in sample data set. The potential error contributed by sample contamination is significant based on past experience. The Laboratory has audited its sampling handling techniques and has achieved consistently low Method Blank readings in the recent past. The past data shows a mean of 2 ug/L and a standard deviation of 1.3 ug/L.

The baseline condition will be that effluent concentrations are below the Action Level.

To conclude that the baseline condition is false (that there is reasonable potential) due to a single outlier sample would constitute the most worrisome decision error (false rejection error). For a set of 10 samples, if the true mean is 2.9 ug/L with a standard deviation of 1.3 ug/L, the probability of at least one sample exceeding 5.9 ug/L is 10%. The probability of the opposite false acceptance error is 20% if the true mean is 4.6 ug/L. These are tolerable limits on decision errors, given that the number of samples is constrained by the negotiated agreement with the RWQCB.

The performance diagram for this case is shown below:



At True Mean = 2.9 ug/L, 10% chance of one sample exceeding 5.9 ug/L WQO  
At True Mean = 4.6 ug/L, 20% chance that no sample will exceed WQO

## 7. Optimize the Design for Obtaining Data

The study design negotiated with the Regional Board consists of the collection of 10 samples over a 5-week period, with 2 samples per week, with at least one sample collected on each day of the week.

The details of the sampling plan are contained in the Sampling Schedule and LSR B913-0210-1.